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Report to Sen. Floyd K. Haskell; Sen. Gary W. Hart; Rep. Timothy E. Wirth; by Elmer B. Staats, Comptroller General.

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A recent GAO report expressed concern about the Solar Energy Research Institute (SERI) and the rather arbitrary basis for establishing the regional SERI network; it was felt that the need for SERI and the regional network should be evaluated prior to the establishment of their respective roles. The creation of SERI was authorized on October 26, 1974, by the Solar Energy Research, Development, and Demonstration Act of 1974. Congress intended SERI to serve as a focal point for solar energy research and development functions, but it is not clear if it also intended SERI's focal point role to apply to commercialization activities. Under the act and its legislative history, the Secretary of Energy has sufficient latitude to focus SERI's functions on research and development and to give the regional centers separate responsibility for commercialization activities. He could also allow other options; one option considered has been designating Department of Energy headquarters or the Midwest Research Institute as the focal point for the regional network's activities. Separately focused roles for SERI and the regional network could lead to fragmentation and lack of coordination. (HTW)



COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

5133  
B-186105

January 24, 1978

The Honorable Floyd K. Haskell  
The Honorable Gary W. Hart  
United States Senate  
The Honorable Timothy E. Wirth  
House of Representatives

In your joint letter which we received on December 13, 1977, you asked for our comments on the Department of Energy's (DOE's) ongoing assessment of the respective roles for the Solar Energy Research Institute (SERI) and the regional SERI network.

Your letter pointed out that DOE is examining the possibility of focusing the roles of SERI and the network on research and commercialization, respectively, and having the regional network report to some institution other than SERI. Accordingly, you requested that we examine whether such a separation of roles between SERI and the network and the lack of central reporting to SERI, and coordination of the roles and budgets by SERI, are within the intent of the Congress in passing the legislation that set up SERI. You also requested our views on whether such a separation would be advisable, independent of whether it is legal.

As you know, we recently issued a report in which we expressed a number of concerns relative to SERI and the rather arbitrary basis for establishing the regional SERI network. We continue to have these concerns and believe that the need for both SERI and the regional network should be evaluated prior to the establishment of their respective roles.

Nevertheless, we have examined the issues raised in your letter under the assumption that such an evaluation has been made and the results support the need for SERI as well as the four centers which comprise the regional network. As agreed with your office, we did not obtain agency comments on this report because of the extremely tight reporting deadline established in your letter.

EMD-78-26  
(990516)

LEGAL BASIS FOR SEPARATE ROLES  
AND RESPONSIBILITIES FOR SERI  
AND THE REGIONAL NETWORK

The creation of SERI was authorized on October 26, 1974, by the Solar Energy Research, Development, and Demonstration Act of 1974 (Public Law 93-473). Our review of the act and its legislative history disclosed that DOE has considerable latitude in determining what specific functions and responsibilities are to be performed by SERI and the regional SERI network. With respect to solar energy research and development functions, however, it is clear from the legislative history that the Congress, in passing this legislation, had intended SERI to serve as the focal point for such functions. Whether the Congress intended SERI's focal point role to apply also to commercialization activities is not at all clear from the act or its legislative history.

Accordingly, given the broad powers of DOE under the act, it would seem that DOE could focus the role of SERI on research and development and the role of the regional SERI network on commercialization without being in direct conflict with the act. Alternatively, SERI could perform both research and development, and commercialization activities.

SERI's focal point role  
for solar energy research  
and development

The act itself is very broad as to what functions are to be performed by SERI. In this regard, section 10(a) of the act provides that SERI:

"\* \* \* shall perform such research, development, and related functions as the [Secretary of Energy] may determine to be necessary or appropriate in connection with the \* \* \* activities under this Act or to be otherwise in furtherance of the -  
pose and objectives of this Act." (Underscore provided.)

Under the provisions of the act, therefore, the Secretary of Energy has considerable flexibility in determining SERI's role.

It is clear from the legislative history of the act, however, that SERI was to have been a focal point at least for solar energy research and development. In this regard, House Report No. 93-1346, which contains the views of the House Committee on Science and Astronautics on the House version of the act, pointed out that the nature of solar energy research

required the close integration of a substantial number of competent scientists and a large amount of specifically designed equipment. The report also stated that SERI would necessitate the use of a laboratory with a large number of such scientists and equipment to effectively concentrate on complex solar energy research and development problems.

In addition, the record of hearings as well as congressional debate on both floors of the House and Senate relative to this legislation contain several references to SERI's intended focal point role for solar energy research and development. For example, during Senate deliberations on this legislation in September 1974, Senator Kennedy stated:

"The provisions of the legislation as amended on the Senate floor today will bring us closer to the time when solar energy will be available for widespread application to meet the heating and power needs of this Nation. The education and training programs it establishes will insure adequate trained scientific and technical manpower to carry out solar energy research; the national laboratory [SERI] it calls for will provide a focal point for that research." (Underscoring provided.)

As pointed out in our September 9, 1977, report, however, the act itself was not clear whether the Congress intended this focal point to be a single facility. Neither the act nor the legislative history of the act gave any specific indication of congressional intent relative to creating either a single SERI or a network of solar laboratories.

In our report, we stated that the extent to which such a focal point is established will depend on how the regional network is controlled and structured. We pointed out, for example, that if DOE structures the regional network as an extension of SERI, then it could be contended that this comes sufficiently close to establishing such a focal point. On the other hand, we indicated that the intended focal point would be lacking if the regional network structure is independent of SERI and is controlled directly through DOE headquarters or some other institution. This was, however, based on the assumption that both SERI and the regional SERI network would have research and development functions and responsibilities.

Application of SERI's  
focal point role to  
commercialization activities

Although the primary emphasis of the act is on solar energy research, development, and demonstration (RD&D), it is evident from the act that the conduct of commercialization activities would be consistent with its purposes and objectives. For example, section 4(d) of the act called for actions to foster the utilization of solar energy for heating and cooling of buildings, generating electricity, and for the production of synthetic fuels. In addition, section 8 of the act established a Solar Energy Information Data Bank for, in part, disseminating information on solar technologies to various interested groups, and called for studies and research on incentives to promote broader utilization and consumer acceptance of solar energy technologies. Thus, given the broad powers of the Secretary of Energy under the act to determine SERI's role, the conduct of commercialization activities could be incorporated as part of the overall functions and responsibilities assigned under the SERI concept.

It could be argued that the Congress intended SERI to serve also as the focal point for such commercialization activities. During the deliberations on the Senate version of the act in September 1974, the late Senator Humphrey, upon introducing the amendment which authorized SERI's creation, indicated that SERI was to serve as such a focal point. In a statement which was contained in the Congressional Record of the Senate on September 17, 1974, Senator Humphrey, on behalf of himself and Senator Kennedy, said:

"This amendment, as it was read, has as its purpose the establishing of a Solar Energy Research Institute to perform research development and related functions and to provide our scientists with the facilities they need to effectively concentrate on complex solar energy research and development problems. This institute may be located at any new or existing Federal laboratory--and I underscore the words 'existing Federal laboratory'--and will provide a focal point for the long-overdue effort to expedite the development and commercial utilization of solar energy." (Underscoring provided.)

We believe, however, that the congressional intent is not sufficiently clear on this aspect of SERI's role. In this connection, Senator Kennedy, who was one of the cosponsors of the Solar Energy Research, Development, and Demonstration Act of 1974 in the Senate, stated that SERI was to provide a focal

point for solar energy research. The statement, which was contained in the Congressional Record on the same day but subsequent to Senator Humphrey's statement, did not mention the possibility of SERI being a focal point for commercialization activities. In addition, the act itself is silent on this aspect of SERI's role and the record of House deliberations on the act provides little or no insight into the congressional intent relative to this point.

Thus, it appears to us that under the act and its legislative history, the Secretary of Energy has sufficient latitude to focus SERI's functions and responsibilities on research and development and to give the regional centers separate responsibility for commercialization activities or, for that matter, to allow commercialization activities to be undertaken at SERI, either exclusively or concurrently with such activities at the regional centers. Similarly, because the record is not sufficiently clear whether the Congress intended commercialization activities to be within the scope of SERI's focal point role, it is apparently within the Secretary's purview to require that the regional network report to some institution other than SERI and to give to such institution the responsibility for coordinating the functions and budgets of the regional components.

In this regard, DOE officials advised us that as part of their ongoing assessment of the roles of SERI and the network, they have been considering a number of options including designating DOE headquarters or the Midwest Research Institute --operating contractor for SERI--as the focal point for the regional network's activities. It should be emphasized, however, that under such an arrangement, SERI's intended focal point role for solar energy research and development would be lacking if, in addition to conducting commercialization activities, the regional components have a research and development role.

ADVISABILITY OF SEPARATE  
ROLES AND RESPONSIBILITIES  
FOR SERI AND THE REGIONAL  
NETWORK

Concerning the advisability of establishing for SERI and the regional SERI network separately focused roles and responsibilities for research and commercialization, we are of the opinion that such a separation can lead to fragmentation, lack of coordination, and a loss of program effectiveness.

For example, this type of separation of functions and responsibilities previously existed between the former Energy Research and Development Administration and the former Federal Energy Administration. In our report on "Energy Policy Decisionmaking, Organization, and National Energy Goals" (EMD-77-31, dated March 24, 1977), we identified a number of gaps in the Federal energy policy-decisionmaking process resulting from such a separation and we pointed out that there lacked an effective mechanism to bridge the gap between research and development of energy technologies, and their commercialization. Also, in the "Declaration of Findings" section of the Department of Energy Organization Act (Public Law 95-91, dated August 4, 1977), the Congress pointed out that such a separation had led to fragmentation and had not allowed for the comprehensive, centralized focus that was needed for effective coordination of energy supply and conservation programs.

Generally, energy research must be performed with an eye to commercialization or waste may occur and commercialization may be delayed. Conversely, commercialization must be carried out in unison with research. Attempts to commercialize a process or technology which is not yet ready, or delays in commercializing processes which are ready, could occur if there is not a closely coordinated interrelationship between research and commercialization activities. Where such activities are closely coordinated, much can be learned in the commercialization process about what additional research is needed, thus providing an effective feedback mechanism to the researchers. All of this is not to say that when this separation of functions does occur that commercialization will be delayed, but it does highlight the need for very close interactions between the two.

In regard to SERI and the regional network, we believe that it may be possible to develop a program with the national SERI performing research and development and the regional network focusing on commercialization, provided that there is an established commercialization strategy and a mechanism in place for effective coordination. However, we believe that a much greater degree of assurance of program effectiveness would be attained by having the regional network report to, and their efforts coordinated by, SERI, as opposed to either DOE headquarters or some other entity. In this way each regional center would be working for and in cooperation with SERI. Such an approach would better ensure that unnecessarily duplicative activities in management, as well as in RD&D and commercialization, are avoided.

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We appreciate the opportunity to assist you in this matter. As agreed with your office, copies of this report are being sent to the Chairman, Subcommittee on Advanced Energy Technologies and Energy Conservation Research, Development, and Demonstration of the House Committee on Science and Technology, and other interested committees and Members of the Congress. Also, copies will be available to the public.

Sincerely yours

A handwritten signature in black ink, appearing to read "Thomas B. Stacks". The signature is written in a cursive style with a large, prominent initial "T".

Comptroller General  
of the United States